# Exhibit 8

**THE UNITED STATES DISTRICT COURT**
**FOR THE MIDDLE DISTRICT OF PENNSYLVANIA**

| | | |
|---|---|---|
| TAMMY KITZMILLER, et al., | ) | |
| | ) | |
| Plaintiffs, | ) | Case No. 04-CV-2688 |
| | ) | |
| v. | ) | Hon. Judge Jones |
| | ) | |
| DOVER AREA SCHOOL DISTRICT and DOVER AREA SCHOOL DISTRICT BOARD OF DIRECTORS, | ) | **DECLARATION OF DR. DICK M. CARPENTER, II** |
| | ) | |
| Defendants. | ) | |
| | ) | |

I, Dick M. Carpenter, II, make this declaration pursuant to 28 U.S.C. § 1746 and based on my personal knowledge.

1. I am an adult resident of the State of Colorado, a citizen of the United States, and an assistant professor of educational leadership, research and foundations at the University of Colorado in Colorado Springs, Colorado. I make this declaration in support of Defendants' Motion for Summary Judgment.

2. I have been retained by Defendants to provide expert testimony in this case. Attached to this declaration as Exhibit A is a true and accurate copy of my Federal Rule of Civil Procedure 26 Disclosure of Expert Testimony. Attached to this declaration as Exhibit B is a true and accurate copy of my Rebuttal To Expert Witnesses For The Plaintiffs.

3. Exhibits A and B contain a complete and accurate statement of all of my opinions expressed in this case to date and the basis and reasons for them; the data or other information I considered in forming the opinions; any exhibits to be used as a summary of or support for these opinions; my qualifications as an expert, including a list of all publications authored by me within the preceding ten years; and the compensation I will receive for my study and testimony. If called to testify at trial in this case, I will testify as to the opinions contained in Exhibits A and B.

I declare (or certify, verify, or state) under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on this 11 day of July, 2005.

Dick M. Carpenter, II

**FEDERAL RULE OF CIVIL PROCEDURE 26**
**DISCLOSURE OF EXPERT TESTIMONY**
**DICK M. CARPENTER II, Ph.D.**

Case: *Tammy Kitzmiller, et al. v. Dover Area School District and Dover Area School District Board of Directors*

Case No. 04-CV-2688

**Expert's Background and Experience:**

As an assistant professor of educational leadership, research, and foundations, I research, write, and teach in the areas of school leadership, politics, policy, and research. My students are typically schoolteachers pursuing graduate degrees for further education and salary advancement and/or credentials that will enable them to assume roles as school principals, superintendents, or counselors.

My leadership courses routinely consider school practices and procedures, educational reform and improvement, and policy creation, implementation, and analysis in multiple domains, including national, state, and local levels. While my research classes evidence some overlap with the leadership classes, the former seek to instill in students facility with multiple research methods in school settings and the ability to think critically about research. To make the course as applied as possible, course content, assignments, and labs focus on research and implications surrounding curricula, policies, and practices.

Attached to this report as Exhibit A is a copy of my curriculum vitae.

**I. The following includes a complete statement of my opinions to be expressed, the reasons and basis underlying them, and the data and other information considered in forming them.**

**Secular pedagogical reasons for referencing the questions surrounding evolution.**

Evaluating a policy involves, in part, examining purposes and incentives. As such, the evaluation begins with questions like: What ends does a particular policy seek to create? What behavior does the policy incentive? The policy adopted by the Dover School Board appears to answer questions like these in at least six ways.

First, the curricular changes contained within this policy raise student awareness about multiple ways of knowing. At the most fundamental level, all research, whether in the social or the natural sciences, seeks to describe reality. As such, researchers attempt to discover or discern the origins of various phenomena, the actions and interactions of objects, creatures, or people within various settings, and/or the meanings inherent within different phenomena.

In this search for knowledge, scientists examine and interpret reality from divergent perspectives. Some are Logical Empiricists, others are Positivists, and still others may be Rationalists, Philosophical Hermeneuticists, or Post Empiricists. These epistemological differences mean researchers may examine the same phenomenon but describe the reality in different ways.

Consistent with this, the policy under question introduces students to the idea of multiple ways of knowing about the development of the natural world. As the scientific literature and the expert witnesses in this case demonstrate, scientists draw different conclusions about this development. The present curricular change introduces students to this fact of epistemological differences.

Second, contemporary pedagogy across many disciplines establishes critical thinking as a goal for students. Warnick and Inch (1994) define it as "the ability to explore a problem, question, or situation; integrate all the available information about it; arrive at a solution or hypothesis; and justify one's position" (p. 11). As such, it examines assumptions, discerns hidden values, evaluates evidence, and assesses conclusions (Myers, 2003).

Petress (1998) provides a workable framework with which to teach others to think critically:

- Sufficiency - is there an adequate amount of support for claims?
- Relevance - is the evidence presented pertinent to the issue at hand?
- Reliability - does the support for arguments have a good track record? Does evidence relied upon emanate from expert sources?
- Consistency - are supporting elements internally and externally consistent with each other and with what we know from other experiences, observations, and sources?
- Recency - is offered support current rather than being out-of-date?
- Access - are supporting materials open for receivers' verification? Are secret or anonymous sources avoided?
- Objectivity - are supporting materials fair and undistorted? Does support originate from expert sources?

And like any skill, critical thinking must be taught. Students must be initially guided through the process of critical thinking—what it is and how it is accomplished—until they internalize and habituate the skill.

The policy under question contributes to the teaching of critical thinking, as defined above, by drawing students' attention to the theoretical nature of evolution, encouraging students to examine it critically, and instructing students in the process of gathering further information. By promoting the process of critical thinking in learning, the policy advances an important and legitimate pedagogical goal.

Third, consistent with the work of pedagogues such as Dewey (1971), Vytgosky (1978), and others, the contested policy encourages students to assume more responsibility in their learning and play an active part in constructing their own knowledge. As Scheurman (1998) describes, a good education includes the development of a deep understanding of problems and procedures and rigorously defensible beliefs about important issues. He concludes:

> This developmental process is enhanced when students learn to view problems and issues from different angles and to identify multiple perspectives within the field of study. Ultimately, knowledge is constructed when students form their own interpretations of evidence submitted to them for review. (p. 6)

By raising student awareness about possible gaps and problems and directing them to additional theories and references, the Dover schools actively fulfill this definition of good pedagogy. Moreover, raising student awareness about gaps and problems provides an opportunity and catalyst for open critical discussion around the controversy in the scientific community.

Fourth, drawing students' attention to weaknesses, gaps, and problems in evolutionary theory is a simple matter of accuracy—a basic premise of any instruction. The course text itself acknowledges the controversy surrounding evolution under a section entitled, "Strengths and Weaknesses of Evolutionary Theory." The Dover Board's policy simply seeks to ensure that students have a fuller understanding of evolutionary theory, including its limitations.

Fifth, the statement under question is, in fact, aligned with the Pennsylvania state standards. Under the Academic Standards for Science and Technology, number 3.2.12A (Inquiry and Design) requires that students be taught to, "Critically evaluate the status of existing theories (e.g., germ theory of disease, wave theory of light, classification of subatomic particles, theory of evolution, epidemiology of aids)" (Pennsylvania State Board of Education, 2002, p. 12). A well-formed critical evaluation of the status of the theory of evolution would be incomplete without reference to current discussion surrounding weaknesses, gaps, and problems.

Finally, as a public school operating under the No Child Left Behind Act of 2001, the Dover Public Schools have acted in accordance with the Santorum Amendment. As adopted by the United States Senate, the Santorum Amendment states that, among other things, schools should help students understand the views inherent in controversial issues, such as biological evolution. The Dover policy seeks to fulfill this direction.

**Pedagogical reasons for including the statement in a biology curriculum.**

It is rather self-evident that if students are to be taught about gaps, problems, or questions concerning evolution, that instruction should occur in a biology class during lessons in which evolution is discussed. Similarly, the biology classroom is the natural venue in which to make students aware of alternative scientific theories of evolution,

such as intelligent design. Finally, the issues surrounding the theories of evolution and intelligent design are debated in the science community; therefore it is properly included as part of the science curriculum.

**Pedagogical reasons for including the statement in the 9th grade biology curriculum at Dover High School.**

Based on the scope and sequence of Pennsylvania state standards and assessments, to which Dover High School naturally aligned its curriculum, students learn about evolution in the 9th grade biology course. Consistent with the aforementioned reasons for including the statement in a biology course, the statement under question is thus included.

In conclusion, teaching problems and gaps in the theory of evolution, making students aware of alternative theories, such as intelligent design, and making resources available to students to pursue independent inquiry promotes legitimate pedagogical and educational goals, and therefore enhances student learning.

In addition to the references cited in this report, I also reviewed a copy of the complaint, the answer, the Pennsylvania Academic Standards for Science and Technology, excerpts from the textbook *Biology* by Miller & Levine, and the expert report of Dr. Michael J. Behe.

References

Dewey, J. (1971). *The child and the curriculum and the school and society*. Chicago: University of Chicago Press.

Myers, D. G. (2003). *Exploring psychology*. New York: Worth.

Pennsylvania State Board of Education. (2002). *Academic standards for science and technology*. Retrieved March 15, 2005, from http://www.pde.state.pa.us/k12/lib/k12/scitech.doc

Petress, K. (1998, September 18). What is critical thinking and why is it useful? *University Times*, pp. 3, 7.

Scheurman, G. (1998). From behaviorist to constructivist teaching. *Social Education, 62*(1), 6-9.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, Trans.). Cambridge, MA: Harvard.

Warnick, B., & Inch, E. (1994). *Critical thinking and communication*. New York: Macmillan.

**II. My qualifications as an expert witness are included in my curriculum vitae, which is attached to this report as Exhibit A, and in my experience and background outlined in this report.**

**III.** **The compensation I will receive for my study, case preparation, and testimony in this matter is $75.00 per hour. All travel expenses will be billed at cost.**

**IV.** **I have testified as an expert at trial or by deposition within the preceding four years in the following case:**

*Hansen v. Ann Arbor Public Schools*, 293 F.Supp.2d 780 (E.D. Mich. 2003)

**Signed:** Ruth M. Carpenter, PhD **Date:** March 24, 2005

# Dick M. Carpenter II, Ph.D.

## Vita

**HOME**

16630 Mesquite Road
Peyton, CO 80831
719-749-2599
coloradodoc@lycos.com

**OFFICE**

University of Colorado
Colorado Springs, CO 80933-7150
719-262-4305
dcarpent@uccs.edu

## EDUCATION

Ph.D., University of Colorado, Denver — 2001
Educational Leadership and Innovation
Dissertation: Presidential Leadership in Education: Rhetoric or Reality

MA, University of Colorado, Colorado Springs — 1997
Educational Leadership
Thesis: Charter schools: Elitism or democracy

BME, University of Colorado, Boulder — 1991
Music Education

## PROFESSIONAL EXPERIENCE

**Assistant Professor of Educational Leadership** — 2002 to Present
*University of Colorado* — Colorado Springs, CO

Teach graduate courses in research and statistics, leadership, policy, and communication. Research areas include educational policy, leadership, communication, and the U.S. Presidency.

**Education Policy Analyst** — 2000 to 2002
*Focus on the Family* — Colorado Springs, CO

Analyzed policy at national, state, and local levels. Researched and wrote on education issues. Worked with elected officials and other policy groups to craft or influence legislation. Represented Focus on the Family at conferences and to various media. Managed the education policy area.

EXHIBIT
tabbies
A

**Adjunct Professor** 1997 to Present
*Colorado Christian University* Colorado Springs, CO

Professor of Education in the Master of Arts in Curriculum and Instruction program. Emphasis in technology, higher education, and assessment. Advise and mentor students in thesis/practicum projects.

**Assistant to the Vice Chancellor for Academic Affairs** 1998 to 2000
*University of Colorado* Colorado Springs, CO

Assisted the Vice Chancellor in providing leadership to an urban research university. Coordinated special projects. Represented the Vice Chancellor on committees. Webmaster for Office of the Vice Chancellor and the Graduate School.

**School Administrator** 1996 to 1998
*Cheyenne Mountain Charter Academy* Colorado Springs, CO

Provided leadership in all aspects of school life. Supervised a staff of 35. Managed a 1.5 million dollar budget. Coordinated curriculum and student services. Directed growth and maintenance of a 10 million dollar facility.

**Teacher** 1991-1996
*Cheyenne Mountain High School* Colorado Springs, CO

Taught Concert Band, Jazz Band, Music Theory, Pep Band, Jazz History, and Film History.

## RELATED EXPERIENCES

**Freelance Professional Musician** 1986 to Present
*Percussionist*

Experiences with:

Colorado Springs Symphony Orchestra, Colorado Springs Philharmonic Orchestra, Colorado Opera, Boulder Philharmonic Orchestra, Colorado Shakespeare in the Park Festival, Various civic groups and churches.

Private percussion instructor. Instructing percussionists from beginners through college undergraduates.

**PUBLICATIONS (peer reviewed)**

Carpenter, D. M., Crawford, M., & Walden, R. (Under Review). Testing the efficacy of team teaching. Journal of Excellence in College Teaching.

Carpenter, D., & Ramirez, A. (Under Review). Gap or gaps: Challenging the singular definition of the achievement gap. Harvard Education Review.

Crawford, M., Carpenter, D. M., & Tindal, G. (Under Review). Exploring the validity of the Oregon extended writing assessment, Journal of Special Education.

Carpenter, D. M. (Under review). Colorado's school safety and zero tolerance policies: Punishment or prevention? Educational Administration Quarterly.

Carpenter, D. M. (Under review). The Columbine effect. Mid-Western Educational Researcher.

Carpenter, D. M. (Under review). Gubernatorial Rhetoric and the Purpose of Education. Educational Policy.

Carpenter, D. M. (Forthcoming). Presidential rhetoric and the purpose of American education. Educational Forum.

Ramirez, A., & Carpenter, D. M. (Forthcoming). Challenging assumptions about the achievement gap. Phi Delta Kappan.

Carpenter, D. M. (2004). Metaphors of education. Journal of School Public Relations, 25(3), 272-291.

Carpenter, D. M. (2004). Like father, like son: Testing the Bush I-Bush II comparison-predictions. The Forum, 2(1), Article 5. http://www.bepress.com/forum/vol2/iss1/art5

Carpenter, D. M. (2004). The important questions and improbabilities of *Making the Grade*. Education Review, http://edrev.asu.edu/reviews/rev275.htm

Carpenter, D. M. (2004). On zero tolerance. Education Review, http://edrev.asu.edu/reviews/rev248.html

Carpenter, D. M. (2003). Book review: Religion, education, and academic success. Journal of Research on Christian Education, 12(2), 261-265.

Carpenter, D. M. (2003). Ronald Reagan and the redefinition of the "Education President." Texas Education Review, http://www.educationreview.homestead.com/2003ReaganEducation.html.

Carpenter, D. M., Pardo, T. R., & Haar, C. (2002). Education's Iron Triangle. Texas Education Review, 2(1), 48-64.

**PUBLICATIONS (non peer reviewed)**

Carpenter, D. M. (2004). Reading scores on the rise. Citizen, 19(1), 5.

Carpenter, D. M. (2004). This way out. Citizen, 18(9), 27-28.

Carpenter, D. M. (2002). Schooled by the liberals. Citizen, 16(6), 22-23.

Haley, M., & Carpenter, D. M. (2002, August). Why is what they're teaching so dangerous? SBCLife, 3.

Carpenter, D. M. (2002, February 21). All views are not created equal. Boundless. [Online]. Available: http://www.boundless.org/2001/features/a0000551.html.

Carpenter, D. M. (2001). Charting the Way to School Reform. [Online]. Citizen. Available: http://www.family.org/cforum/citizenmag/webonly/A0016341.html.

Carpenter, D. M. (2001). For the children? [Online]. Citizen. Available: http://www.family.org/cforum/citizenmag/webonly/A0017220.html

Carpenter, D. M. (2000, December/January). Ohio teacher overcomes union's intolerance. Citizen, 14(12), 10.

Carpenter, D. M., & Smithouser, R. (2000). Teens and parents get a fresh start. Plugged In, 5(39), 3-4.

Carpenter, D. M. (2000). School wars. Citizen, 14(10), 12-13.

Carpenter, D. M. (2000, November). Never too young to indoctrinate. Citizen, 14(11), 26-28.

Carpenter, D. M. (1999). Me and my shadow. Teachers in Focus, 8(8), 22.

Carpenter, D. M. (1999). Not all charter schools are created equal. Focus on the Family, 23(8), 12-13.

**OP-EDS AND COMMENTARIES**

Carpenter, D. M. (2004, September 11). Negative campaigning is as old as our republic. Colorado Springs Gazette, p. Metro9.

Carpenter, D. M. (2004). Are charter schools in trouble? Citizen. [Online]. http://www.family.org/cforum/citizenmag/webonly/A0033383.cfm

Carpenter, D. M. (2004, June 9). Redefining the education president, [Online] Thomas B. Fordham Foundation. http://www.edexcellence.net/foundation/global/page.cfm?id=214

Carpenter, D. M. (2002, July 18). The NEA Urban Myth. Philadelphia Tribune.

Carpenter, D. M. (2002, July 2). The land of the free. East Mesa Independent.

Carpenter, D. M. (2002, July 2). The land of the free. The Brooklyn Skyline.

Carpenter, D. M. (2002, June 27). The establishment's last excuse. Yonkers Home News & Times.

Carpenter, D. M. (2002, June 27). The establishment's last excuse. The Utah County Journal.

Carpenter, D. M. (2002, June 27). The establishment's last excuse. Prince George's Journal.

Carpenter, D. M. (2002, June 27). The establishment's last excuse. Prince George's Sentinel.

Carpenter, D. M. (2002, May 3). The NEA urban myth. Fayetteville Citizen.

Carpenter, D. M. (2002, May 3). The NEA urban myth. The Christian Times.

Carpenter, D. M. (2002, May 3). The NEA urban myth. North Castle News.

Carpenter, D. M. (2002, May 3). The NEA urban myth. Rye Chronicle.

Carpenter, D. M. (2001, September 29). ALA misusing alarming rhetoric in fight against book 'bans.' Pasadena Star-News.

Carpenter, D. M. (2001, September 29). ALA misusing alarming rhetoric in fight against book 'bans.' Whittier Daily News.

Carpenter, D. M. (2001, September 20). Pork barrels. Times Leader.

Carpenter, D. M. (2001, September 12). Pork barrel politics: Feedin' at the trough. Chicago Defender.

Carpenter, D. M. (2001). Summer school sentence. Union Leader.

Carpenter, D. M. (2001, July 8). Summer school sentence. Elmira Star Gazette.

Carpenter, D. M. (2001, July 2). Half-truths and the National Education Association. The Columbian.

Carpenter, D. M. (2001, June 30). Half-truths and the National Education Association. The Salida Mt. Mail.

Carpenter, D. M. (2001, June 18). Summer school wave crests. Washington Times.

Carpenter, D. M. (2001). When will we learn our lesson about the "education president?", [Online]. EducationNews.org. Available: www.educationnews.org/focus_on_the_family_when_will_w.htm.

**PRESENTATIONS (peer reviewed)**

Carpenter, D., & Ramirez, A. (2004, July 8). Gap or gaps: Challenging the singular definition of the achievement gap. Paper presented at the National Evaluation Institute, Colorado Springs, CO.

Carpenter, D. (2004, April 14). Presidential rhetoric and the purpose of American education. Paper presented at the American Educational Research Association Conference, San Diego, CA.

Carpenter, D. (2004, April 12). Suspensions and expulsions in Colorado after zero tolerance: A statewide assessment. Paper presented at the American Educational Research Association Conference, San Diego, CA.

Carpenter, D. (2003, November 16). Gubernatorial rhetoric and civic education: Why civic education remains at the margins. Paper presented at the International Conference on Civic Education, New Orleans, LA.

Carpenter, D. (2003, October 9). The Columbine effect: Perception or reality? Paper presented at the Northern Rocky Mountain Educational Research Association conference, Jackson, WY.

Carpenter, D. (2002, September 27). Colorado's school safety and zero tolerance policies: Punishment or prevention? Paper presented at the Conference on Colorado's Future: Meeting the Needs of a Changing State, Colorado Springs, CO.

Carpenter, D. (2002, March 27-30). The education president? How Ronald Reagan redefined the "Education President." Paper presented at the National Conference on the Reagan Presidency, Santa Barbara, CA.

Carpenter, D. (2001, November 17-18). A captive audience. Paper presented at the annual NARTH conference, Washington, DC.

Carpenter, D., Orman, P., Guzman, N., & Muth, R. (2000, November 3-5). Developing a campus-wide shared vision: Colorado's TLE initiative. Paper presented at the University Council for Educational Administration, Albuquerque, NM.

Guzman, N., Hackman, M., & Carpenter, D. (2000, November 3-5). The evolution of a leadership development program: The actualization of constructivism, awareness, and community. Paper presented at the International Leadership Association, Toronto, Canada.

**PRESENTATIONS (invited)**

Carpenter, D. M. (2004, November 5). Communicating through the web. Presented at the annual Association of Christian Schools International conference, Denver, CO.

Carpenter, D. M. (2004, February 2). Gubernatorial rhetoric and civic education. Presented at the Education Commission of the States, Denver, CO.

Carpenter, D. M. (2003, November 6). Webquests in the classroom. Presented at the annual Association of Christian Schools International conference, Denver, CO.

Carpenter, D. M. (1998). "Music standards: Not knowing is no excuse." Pikes Peak BOCES, Colorado Springs, CO.

**PRESENTATIONS (non peer reviewed)**

Carpenter, D. M. (2005). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Houston, TX.

Carpenter, D. M. (2004). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Fresno, CA.

Carpenter, D. M. (2004). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Minneapolis, MN.

Carpenter, D. M. (2004). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Raleigh, NC.

Carpenter, D. M. (2004). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Vancouver, BC.

Carpenter, D. M. (2004). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Pensacola, FL.

Carpenter, D. M. (2004). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Nashville, TN.

Carpenter, D. M. (2003). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Oklahoma City, OK.

Carpenter, D. M. (2003). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Toronto, Canada.

Carpenter, D. M. (2003). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Portland, OR.

Carpenter, D. M. (2003). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Detroit, MI.

Carpenter, D. M. (2003). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Austin, TX.

Carpenter, D. M. (2002). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Washington, DC.

Carpenter, D. M. (2002). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Pasadena, CA.

Carpenter, D. M. (2002). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Kansas City, MO.

Carpenter, D. M. (2002). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Phoenix, AZ.

Carpenter, D. M. (2002). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Charlotte, NC.

Carpenter, D. M. (2001). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Orlando, FL.

Carpenter, D. M. (2001). "Teaching captivity," "Why is what they're teaching so dangerous?" Love Won Out Conference, Atlanta, GA.

Carpenter, D. M. (2001). "Teaching captivity." Love Won Out Conference, Philadelphia, PA.

Carpenter, D. M. (2001). "Teaching captivity." Love Won Out Conference, San Diego, CA.

Carpenter, D. M. (2000). "Teaching captivity." Love Won Out Conference, Colorado Springs, CO.

**MEDIA CONSULTATIONS/INTERVIEWS**

KPFT-FM, Houston, TX, (2005). February 19.
WEZE-FM, Boston, MA, (2004). September 21.
*Chronicle of Higher Education*, Washington, DC, (2004). June 6.
*Education Week*, Bethesda, MD, (2004). June 8.
WMCU, Miami, FL, (2003). May 27.
American Family Radio, Tupelo, MS, (2002). July 30.
*Janet Parshall's America*, National, (2002). July 17.
WJTM-FM, Frederick, MD, (2002). July 11.
WJTM-FM, Frederick, MD, (2002). June 28.
USA Radio Network News, National, (2002). June 26.
WAVA-FM, Arlington, VA, (2002). June 18.
KSLR-FM, San Antonio, TX, (2002). June 14.
KOA-AM, Denver, CO, (2002). June 7.
WMUZ-FM, Detroit, MI, (2002). June 3.
Vienna Broadcasting, Vienna, Austria, (2002). May 24.
WCSG-FM, Grand Rapids, MI, (2002). May 14.
Associated Press Radio, National, (2002). May 10.
*Dallas Morning News*, Dallas, TX, (2002). May 3.
KSLR-FM, San Antonio, TX, (2002). April 11.
*Columbia World*, Columbia, NC, (2002). April.
WYOO-FM, Panama City, FL, (2002). March 29.
KLIF-AM, Dallas, TX, (2002). February 27.
WCCB-TV, Charlotte, NC, (2002). February 23.
*Education Week*, Bethesda, MD, (2002). February 21.
WOGR-AM, Charlotte, NC, (2002). February 20.
WAVA-FM, *Janet Parshall's America*, Arlington, VA, (2002). February 21.
AP Radio, (2002). February 20.
Family News in Focus, Colorado Springs, CO, (2002). February 13.
Family News in Focus, Colorado Springs, CO, (2002). February 8.
KSLR-FM, San Antonio, TX, (2002). January 28.
WMUZ-FM, Detroit, MI, (2002). January 21.
SRN News, National Radio Broadcast, (2002). January 14.
*Daily Times*, Primos, PA, (2002). January 9.
*America's First Freedom*, Washington, DC, (2002). January.
WMUZ-FM, Detroit, MI, (2001). December 26.
WDCD-FM, Philadelphia, PA, (2001). December 21.
WMUZ-FM, Detroit, MI, (2001). December 19.
*Press-Enterprise*, Bloomsburg, PA, (2001). December 13.
*The Gazette*, Colorado Springs, CO, (2001). October 29.
KBRT-AM, Los Angeles, CA, (2001). October 29.
*The Daily Oklahoman*, Oklahoma City, OK, (2001). September 30.
USA Radio, (2001). September 27.
*Colorado Daily*, Boulder, CO, (2001). September 27.
UNI Radio, (2001). September 26.
CNS News Service, (2001). September 25.

WPZZ-FM, Indianapolis, IN, (2001). September 19.
KKMS-FM, Minneapolis, MN, (2001). September 7.
USA Radio Network, (2001). August 23.
*Sacramento Bee*, Sacramento, CA, (2001). August 30.
*Education Reporter*, St. Louis, MO, (2001). August.
WPZZ-FM, Indianapolis, IN, (2001). August 20.
WNWC-FM, Madison, WI, (2001). August 13.
Family News in Focus, Colorado Springs, CO, (2001). August 13.
KSLR-FM, San Antonio, TX, (2001). August 2.
WAVA-FM, *Janet Parshall's America*, Arlington, VA, (2001). July 31.
Family News in Focus, Colorado Springs, CO, (2001). July 27.
*Chicago Tribune*, Chicago, IL, (2001). July 27.
WYLL-AM, Chicago, IL, (2001). July 26.
Family News in Focus, Colorado Springs, CO, (2001). July 24.
WAVA-FM, *Janet Parshall's America*, Arlington, VA, (2001). July 10.
Moody Broadcasting Network, Chicago, IL, (2001). July 9.
*The Christian Perspective*, Douglas, GA, (2001). July 9.
Freedom Forum, (2001). July 8.
WNWC-FM, Madison, WI, (2001). July 6.
*World Wide News Room*, (2001). July 6.
*Christianity Times*, Washington, DC, (2001). July 6.
CNS News Service, (2001). July 6.
WYLL-AM, Chicago, IL, (2001). July 6.
Citizenlink.org, Colorado Springs, CO, (2001). July 6.
*Milwaukee Journal Sentinel*, Milwaukee, WI, (2001). July 5.
*Daily Camera*, Boulder, CO, (2001). July 5.
*Washington Post*, Washington, DC, (2001). July 4.
*RA Today*, Washington, DC, (2001). July 4.
Citizenlink.org, Colorado Springs, CO, (2001). July 4.
*Washington Times*, Washington, DC, (2001). July 3.
KBJS-FM, Jacksonville, TX, (2001). July 3.
American Family Radio, Tupelo, MS, (2001). July 3.
KPCC-FM, Los Angeles, CA, (2001). July 3.
*World Wide News Room*, (2001). July 3.
*NEA Today*, Washington, DC, (2001). July 3.
Religion News Service, Los Angeles, CA, (2001). July 3.
WYOO-AM, Panama City, FL, (2001). July 3.
*Tim Kimmel Live*, Syndicated, (2001). July 3.
KKLA-FM, Los Angeles, CA, (2001). July 3.
KSLR-FM, San Antonio, TX, (2001). June 30.
KKMS-FM, Minneapolis, MN, (2001). June 29.
Talk America Radio Network, (2001). June 28.
KPCC-FM, Los Angeles, CA, (2001). June 28.
WYLL-AM, Chicago, IL, (2001). June 28.
Family News in Focus, Colorado Springs, CO, (2001). June 26.
Citizenlink.org, Colorado Springs, CO, (2001). June 26.
Family News in Focus, Colorado Springs, CO, (2001). June 26.
*World Net Daily*, Online, (2001). June 26.

Religion News Service, (2001). June 25.
*Youth Today*, (2001). June 24.
*The Gazette*, Colorado Springs, CO, (2001). June 24.
KPCC-FM, Los Angeles, CA, (2001). June 22.
*Los Angeles Times*, Los Angeles, CA, (2001). June 22.
KDQ-FM, Los Angeles, CA, (2001). June 21.
*MSNBC.com*, (2001). June 20.
*Bulletin's Frontrunner*, (2001). June 19.
*Washington Post*, Washington, DC, (2001). June 19.
*Press Enterprise*, Bloomsburg, PA, (2001). June 17.
Family News in Focus, Colorado Springs, CO, (2001). June 15.
WMUZ-FM, Detroit, MI, (2001). June 14.
Family News in Focus, Colorado Springs, CO, (2001). June 7.
Citizenlink.org, Colorado Springs, CO, (2001). June 4.
KSLR-FM, San Antonio, TX, (2001). June 4.
Family News in Focus, Colorado Springs, CO, (2001). June 2.
Family News in Focus, Colorado Springs, CO, (2001). May 30.
Family News in Focus, Colorado Springs, CO, (2001). May 28.
WMUZ-FM, Detroit, MI, (2001). May 27.
Family News in Focus, Colorado Springs, CO, (2001). May 22.
Family News in Focus, Colorado Springs, CO, (2001). May 21.
Family News in Focus, Colorado Springs, CO, (2001). May 9.
*Associated Press,* (2001). May 8.
Family News in Focus, Colorado Springs, CO, (2001). May 5.
Family News in Focus, Colorado Springs, CO, (2001). April 14.
Family News in Focus, Colorado Springs, CO, (2001). April 9.
Family News in Focus, Colorado Springs, CO, (2001). April 7.
Family News in Focus, Colorado Springs, CO, (2001). April 4.
Family News in Focus, Colorado Springs, CO, (2001). April 3.
Citizenlink.org, Colorado Springs, CO, (2001). March 31.
Family News in Focus, Colorado Springs, CO, (2001). March 31.
Pastor's Weekly Briefing, Colorado Springs, CO, (2001). March 30.
Family News in Focus, Colorado Springs, CO (2001). March 26.
*Pro-Family News,* Minneapolis, MN, (2001). March.
SRN News, National Radio Broadcast, (2001). March 20.
Pastor's Weekly Briefing, Colorado Springs, CO, (2001). March 16.
Beliefnet.com, New York, (2001). March 13.
Family News in Focus, Colorado Springs, CO, (2001). March 8.
Family News in Focus, Colorado Springs, CO, (2001). March 6.
Family News in Focus, Colorado Springs, CO, (2001). February 23.
Family News in Focus, Colorado Springs, CO, (2001). February 21.
Family News in Focus, Colorado Springs, CO, (2001). February 15.
*New Republic* magazine, Washington, DC, (2001). February 5.
Family News in Focus, Colorado Springs, CO, (2001). February 5.
Citizenlink.org, Colorado Springs, CO, (2001). January 24.
Family News in Focus, Colorado Springs, CO, (2001). January 23.
Family News in Focus, Colorado Springs, CO, (2001). January 9.
Family News in Focus, Colorado Springs, CO, (2000). December 20.

**REBUTTAL TO WITNESSES FOR THE PLAINTIFFS**
**DICK M. CARPENTER II, PH.D.**

Case: *Tammy Kitzmiller, et al. v. Dover Area School District and Dover Area School District Board of Directors*

Case No. 04-CV-2688

In response to assertions made by Drs. Alters and Padian, the Dover School District policy meets several legitimate pedagogical goals. The following discussion illustrates how and why using standards from the science education community.

To begin, Alters and Padian assert that the Dover policy results in poor pedagogy and improper and inferior science education because it:

a. makes students aware both of gaps or weaknesses in evolutionary theory and of other alternatives,
b. requires teachers to disregard and contradict the science community by teaching that intelligent design theory (IDT) is science and that there is no debate in the science community about the nature of evolution, and
c. undermines the "structure and logic of science."

However, the legitimacy of the policy is evident in at least four ways. First, it accurately makes students aware of evolution as a developing theory rather than a proven fact. Second, it raises student awareness to the existence of alternatives currently discussed and debated both within and outside of the scientific community. Third, it encourages students to think critically, which is an important skill both in science inquiry and general learning. Finally, it accomplishes all of this while maintaining a standards-based focus on evolution.

1. *Evolution as Theory Rather than Fact*

Although Dr. Alters would have students believe evolution is an unquestioned cornerstone of science, those in the science community indicate otherwise. In their expert reports, Drs. Dembski, Minnich, and Behe effectively presented numerous examples of those in the scientific community who question various aspects of the utility, validity, and accuracy of evolution. Moreover, the Dover High School course text states, "Like any scientific theory, evolutionary theory continues to change as new data are gathered and new ways of thinking arise…[R]esearchers still debate such important questions as precisely how new species arise and why species become extinct. There is also uncertainty about how life began" (p. 386).

Even the *National Science Education Standards* (*NSES*), created and endorsed by the National Science Teachers Association, the National Science Foundation, the National Academy of Sciences, and the National Research Council, among others, characterize evolution as "incomplete."

> Because all scientific ideas depend on experimental and observational confirmation, all scientific knowledge is, in principle, subject to change as new evidence becomes available. The core ideas of science such as the conservation of energy or the laws of motion have been subjected to a wide variety of confirmations and are therefore unlikely to change in the areas in which they have been tested. In areas where data or understanding are incomplete, such as the details of human evolution or questions surrounding global warming, new data may well lead to changes in current ideas or resolve current conflicts. In situations where information is still fragmentary, it is normal for scientific ideas to be incomplete, but this is also where the opportunity for making advances may be greatest. (National Science Education Standards, 1996c)

Therefore, the Dover policy accurately and legitimately represents the current status of the understanding of evolution as illustrated by discussions within the scientific community, the course text, and the *NSES*.

2. *Discussion and Debate about Alternative Theories*

Contrary to the assertions of Alters and others, there is current discussion and debate both within and outside the scientific community about alternatives to evolution, one of which includes IDT. In their export reports, Drs. Behe and Campbell provide ample evidence to this fact. Further, in an article on the testability of evolutionary hypotheses, Penny, Hendy, and Poole (2003) include IDT as a legitimate alternative scientific theory.

Outside the scientific community, the debate's latest manifestation comes in the form of hearings by the Kansas State Board of Education on IDT and evolution (Hanna, 2005). This follows similar discussions in Ohio (Parker, 2004) and action in the United States Senate calling for the teaching of such debates, including their origins and the views represented therein (United States Senate, 2001).

The pedagogical result of making students aware of these discussions and debates is consistent with the *NSES* in at least two ways. First, it prepares students for their role in public dialogue. "The goals for school science that underlie the *National Science Education Standards* are to educate students who are able to…engage intelligently in public discourse and debate about matters of scientific and technological concern" (National Science Education Standards, 1996d).

Second, it demonstrates the role of new ideas and theories in science and the importance of intellectual diversity.

> Science is a discipline in which creative and sometimes risky thought is important. New ideas and theories often are the result of creative leaps. For students to understand this aspect of science and be willing to express creative ideas, all of the members of the learning community must support and respect a diversity of experience, ideas, thought, and expression. (National Science Education Standards, 1996b)

Of course, one may argue, as do Alters, Padian, and others, that IDT is not science, thereby negating its standing as a legitimate alternative. Again, the expert reports of Drs. Dembski,

Minnich, and Behe demonstrate the scientific nature of IDT. Intelligent Design research has been published in peer-reviewed, scientific journals. IDT researchers have a clear scientific research agenda, and IDT principles inform the work of research scientists.

Undoubtedly, IDT represents a minority viewpoint in the science community, and using the aforementioned language from the *NSES*, one could describe IDT as "new," "creative," or "risky." However, that does not contradict its standing as a legitimate alternative nor provide reasonable motivation to prohibit school personnel from merely making students aware of its existence by referring them to a book in the school library. Indeed, the Dover policy seeks to create a "learning community [that] support[s] and respect[s] a diversity of experience, ideas, thought, and expression" consistent with the *NSES*.

3. *Critical Thinking in Scientific Inquiry*

According to the *NSES* (1996c), critical thinking plays a central role in scientific inquiry, and students should learn those skills in an active, engaged manner.

> Student inquiry in the science classroom encompasses a range of activities. Some activities provide a basis for observation, data collection, reflection, and analysis of firsthand events and phenomena. Other activities encourage the critical analysis of secondary sources--including media, books, and journals in a library. (National Science Education Standards, 1996b)

The Dover policy adheres to this description. Students are encouraged to think critically about what they read and hear in class and also to analyze alternatives through a secondary source in the school library.

The latter activity is specifically discussed in the national standards.

> RECOGNIZE AND ANALYZE ALTERNATIVE EXPLANATIONS AND MODELS. This aspect of the standard emphasizes the critical abilities of analyzing an argument by reviewing current scientific understanding, weighing the evidence, and examining the logic so as to decide which explanations and models are best. In other words, although there may be several plausible explanations, they do not all have equal weight. Students should be able to use scientific criteria to find the preferred explanations. (National Science Education Standards, 1996c)

Applied specifically to the case in question, as a result of the statement read in class Dover students may read *Of Pandas and People* in the school library and dismiss IDT as the weaker argument. They may, instead, conclude that evolution is the preferred explanation. If IDT is as sloppy as critics contend, and if evolution is as ironclad as they portray, a critical analysis of the alternative will only strengthen the case for evolution, thus allaying Alters' fear of sending "an inaccurate signal that evolution is an inferior science."

Moreover, if students are presented a singular position about evolution (inferring that it is unquestionable) and are never made aware of alternatives, students lack the opportunity to

practice this skill of "recogniz[ing] and analyz[ing] alternative explanations and models" as it relates to evolution, a skill scientists not only recommend but practice.

For example, Sober and Steel (2002) assert that the "Hypothesis of Common Ancestry," a central feature of contemporary evolutionary theory, "needs to be looked at more closely" (p. 401). They continue:

> This proposition is central because it is presupposed so widely in evolutionary research. When biologists attempt to reconstruct the phylogenetic relationships that link a set of species, they usually assume that the taxa under study are genealogically related. Whether one uses cladistic parsimony, distance measures, or maximum likelihood methods, the typical question is which tree is the best one, not whether there is a tree in the first place. The same presupposition is at work in the pattern of reasoning that biologists often use to develop adaptive hypotheses. When biologists consider the possible adaptive reasons why a species exhibits some trait, they usually think about the trait as evolving against a background of biological features already in place. They infer what that ancestral condition was by assuming that there is a phylogenetic tree that unites the species of interest with other species. Traits of sister groups are then "read back" into the past (using parsimony or some other method of inference), thereby providing an estimate of the trait values of ancestors. In view of the importance within evolutionary biology of the Hypothesis of Common Ancestry, it is worth reviewing what evidence there is that the hypothesis is true. (p. 395-396)

Sober and Steel then examine various models to test the "Hypothesis of Common Ancestry," concluding it is intrinsically difficult to test. Penny, et al. (2003) respond to Sober and Steel by suggesting ways to test not only the descent hypothesis but also alternatives, including intelligent design.

These two articles illustrate several points of note. First, as referenced earlier, sufficient questions about evolution persist so that scientists continue to examine and debate its various components. Second, intelligent design is examined as a scientific alternative. Third, scientists critically investigate evolutionary tenets and recommend others do likewise.

Indeed, the *NSES* (1996a) state: "Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations." As such, the Dover policy aligns effectively and legitimately.

4. *A Standards-Based Focus on Evolution*

Whether implicitly or explicitly, the *teaching* of IDT plays a central role in the arguments of Alters and Padian. Indeed, the latter states, "If [IDT] were presented in science classes," it would result in an understanding of evolutionary biology that would be "deficient and misinformed" and science training that would be "significantly inferior." The prior discussion and the reports and rebuttals of other witnesses for the defense clearly debate the latter portion of Padian's argument, but in many ways the arguments place second in priority to the operative word in Padian's statement—If.

In fact, Dover High School biology courses do not teach IDT. They teach only evolution consistent with the Pennsylvania State Academic Standards for Science and Technology (Pennsylvania State Board of Education, 2002) and the *NSES* (National Science Education Standards, 1996c). Moreover, the course text and presumably other direct course materials do not teach IDT. Students are encouraged to analyze other alternatives, of which IDT is one, *on their own initiative and time.*

Thus, by encouraging critical thinking, facilitating the analysis of alternative ways of knowing, and making students aware of current discussions, trends, and debates both within and outside the scientific community related to evolution, the Dover schools strive toward legitimate pedagogical goals while maintaining a standards-based curriculum focused on evolution.

## References


Hanna, J. (2005, April 30). Evolution debate turns into debate over intelligent design. *Associated Press State & Local Wire.*

National Science Education Standards. (1996a). *Chapter 2.* Retrieved May 2, 2005, from http://www.nap.edu/readingroom/books/nses/html/2.html

National Science Education Standards. (1996b). *Chapter 3.* Retrieved May 2, 2005, from http://www.nap.edu/readingroom/books/nses/html/3.html

National Science Education Standards. (1996c). *Chapter 6.* Retrieved May 2, 2005, from http://www.nap.edu/readingroom/books/nses/html/6a.html

National Science Education Standards. (1996d). *Introduction.* Retrieved May 2, 2005, from http://www.nap.edu/readingroom/books/nses/html/1.html

Parker, L. (2004, November 29). School science debate has evolved. *USA Today,* p. 3.

Pennsylvania State Board of Education. (2002). *Academic standards for science and technology.* Retrieved March 15, 2005, from http://www.pde.state.pa.us/k12/lib/k12/scitech.doc

Penny, D., Hendy, M. D., & Poole, A. M. (2003). Testing fundamental evolutionary hypotheses. *Journal of Theoretical Biology, 223*(3), 377-385.

Sober, E., & Steel, M. (2002). Testing the hypothesis of common ancestry. *Journal of Theoretical Biology, 218*, 395-408.

United States Senate. (2001). No Child Left Behind--Conference Report (Vol. 147, pp. S13365-S13422). Washington, DC: Congressional Record.


**Signed:** _____ **Date:** MAY 16, 2005